ASIPP

Improvement of EAST Data Acquisition Configuration Management

Ying Chen, Shi Li

Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, Anhui,230031, China   *Corresponding Author: Email: cheny@ipp.ac.cn

Introduction

EAST (Experimental Advanced Superconducting Tokamak) has been in operation since 2006 and the physics experiments have been developed further in support of high-performance steady-state operation. The EAST data acquisition system, which provides unified diagnostic data acquisition and long-term data storage. The data acquisition console, which is an important component of the EAST data acquisition system, is used to manage configuration information and control the data acquisition process. The old data acquisition console was developed many years ago, and now it is planned to update, mainly to upgrade the configuration management function. Key requirements of the updated data acquisition console are described as follows:

➤ There are already 60 data acquisition nodes in the EAST data acquisition system. The updated data acquisition console should still manage these DAQ nodes.

➤ The old data acquisition console was only designed for diagnostic data acquisition, without considering of the later control nodes. Therefore, the updated data acquisition console should manage these control nodes.

➤ It is necessary to optimize the configuration management function and provide backup database function.

➤ In order to facilitate the internal data acquisition test, it is necessary to add the function of simulation data acquisition test.

System Design
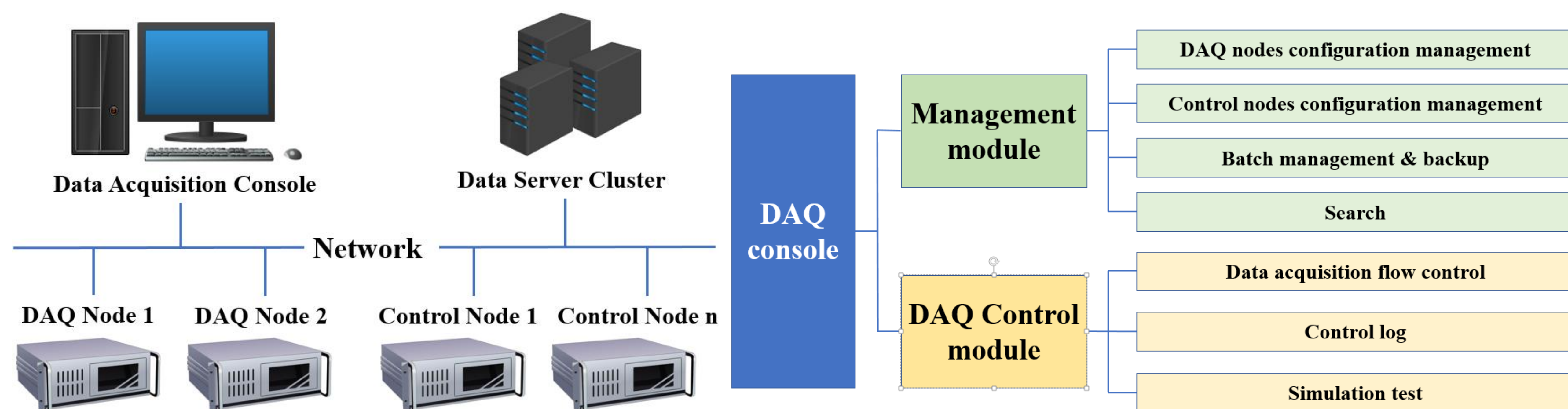
The EAST data acquisition system includes a data acquisition console, data server cluster, DAQ nodes, and control nodes. All the components are in a local area network (LAN). The improvement is about the data acquisition console (DAQ console). The DAQ console is divided into 2 modules: management module and control module.

The management module improves the configuration management of DAQ nodes, adds the configuration management of control nodes, retains the function of signal search, and adds the function of batch management and database backup.

The DAQ control module can automatically control the active DAQ nodes' working flow, which is consistent with the old system. Compared with the original system, the function of log and shot simulation test are increased.

Conclusion

The updated data acquisition console has implemented a beta version. The beta DAQ console is based on LabVIEW, and retains the original function of the old console, which can manage the DAQ nodes and control the long-pulse data acquisition flow, and add some new functions on this basis. It can manage DAQ and control nodes, batch manage and configuration database backup, and provides shot simulation test. At present, the beta DAQ console is considered to be used for the EAST data acquisition system internal testing, especially for the pre-launch testing of a new DAQ node.

System Implementation

The updated system provides a GUI with three parts: operation area, display area, and control area. The operation area and display area are for the management module, while the control area is designed for the control module.

In the operation area, user can perform some operations to view and manage the nodes information.

In the display area, user can edit the data in status, das, card, and control table with the save/add/delete/refresh button.

In the control area, it provides some control functions for user to do some DAQ internal test.